

WHAT IS CLAIMED IS:

1. A photopolymerizable composition comprising:
 - (a) a polymerizable compound having an addition-polymerizable unsaturated bond;
 - (b) an organic dye; and
 - (c) at least one kind of an organoboron compound represented by the following general formula (I) in a proportion of at least one mole per mole of the organic dye:

General formula (I)



wherein R is selected from the group consisting of an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, an aralkyl group, a substituted aralkyl group, an alkaryl group, a substituted alkaryl group, an alkenyl group, a substituted alkenyl group, an alkynyl group, a substituted alkynyl group, an alicyclic group, a substituted alicyclic group, a heterocyclic group, a substituted heterocyclic group, and a derivative thereof; R_s may be the same as or different from each other; two or more of these groups may join together directly or via a substituent and form a boron-containing heterocycle; and X represents an alkali metal, quaternary ammonium, pyridinium, quinolinium, diazonium, morpholinium, tetrazolium, acridinium,

phosphonium, sulfonium, oxosulfonium, iodonium, S, P, Cu, Ag, Hg, Pd, Fe, Co, Sn, Mo, Cr, Ni, As, or Se.

2. A photopolymerizable composition according to claim 1, wherein the organic dye is at least one selected from the group consisting of a cationic dye, an anionic dye, and a nonionic dye.

3. A photopolymerizable composition according to claim 1, wherein the photopolymerizable composition further includes heat-responsive microcapsules comprising a color-forming component.

4. A photopolymerizable composition according to claim 1, wherein the polymerizable compound having an addition-polymerizable unsaturated bond is photoreactive and hardens due to photopolymerization.

5. A photopolymerizable composition according to claim 1, wherein the polymerizable compound having an addition-polymerizable unsaturated bond is at least one of a substantially colorless compound having in the molecule thereof a polymerizable group and a site which reacts with a color-forming component so as to develop a color and a substantially colorless compound having in the molecule thereof a polymerizable group and a site which inhibits the reaction between a color-forming component and another compound.

6. A recording material comprising a support and at least one recording layer provided thereon which includes a photopolymerizable composition comprising: (a) a

polymerizable compound having an addition-polymerizable unsaturated bond; (b) an organic dye; and (c) at least one kind of an organoboron compound represented by the following general formula (I) in a proportion of at least one mole per mole of the organic dye:

General formula (I)



wherein R is selected from the group consisting of an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, an aralkyl group, a substituted aralkyl group, an alkaryl group, a substituted alkaryl group, an alkenyl group, a substituted alkenyl group, an alkynyl group, a substituted alkynyl group, an alicyclic group, a substituted alicyclic group, a heterocyclic group, a substituted heterocyclic group, and a derivative thereof; Rs may be the same as or different from each other; two or more of these groups may join together directly or via a substituent and form a boron-containing heterocycle; and X represents an alkali metal, quaternary ammonium, pyridinium, quinolinium, diazonium, morpholinium, tetrazolium, acridinium, phosphonium, sulfonium, oxosulfonium, iodonium, S, P, Cu, Ag, Hg, Pd, Fe, Co, Sn, Mo, Cr, Ni, As, or Se.

7. A recording material according to claim 6, wherein the at least one recording layer comprises a multicolor

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multilayer recording layer formed by lamination of layers, each of which is adopted for producing a different color.

8. The recording material according to claim 7, wherein the layers contain first to i th layers, the first recording layer being sensitive to light having a central wavelength of λ_1 and developing a color, a second recording layer being sensitive to light having a central wavelength of λ_2 , and developing a color different from the color of the first recording layer, . . . and an i th recording layer being sensitive to light having a central wavelength of λ_i and developing a color different from the colors of $i-1$ th recording layer, with the layers being laminated in a direction of thickness of the multilayer recording layer from the plane on which recording light is incident, and i being at least 2.

9. A recording material according to claim 7, wherein the multicolor multilayer recording layer comprises at least one intermediate layer between the recording layers.

10. A recording material according to claim 6, wherein the recording layer includes a protective layer as an outermost layer.

11. A recording material according to claim 6, wherein the recording layer is a photo- and heat-sensitive recording layer.

12. A recording material according to claim 6, wherein the recording layer is a photo- and pressure-sensitive recording layer.

13. A recording material according to claim 6, wherein the photopolymerizable composition further includes heat-responsive microcapsules including a color-forming component.

14. A recording material according to claim 11, wherein the photopolymerizable composition includes heat-responsive microcapsules including a color-forming component A, and, outside the microcapsules, a substantially colorless compound B having in the molecule thereof a polymerizable group and a site which reacts with the color-forming component A to develop a color, and a photopolymerization initiator comprising the organic dye and the organoboron compound.

15. A recording material according to claim 11, wherein the photopolymerizable composition includes heat-responsive microcapsules enclosing a color-forming component A, and, outside the microcapsules, a substantially colorless compound C having a site which reacts with the color-forming component A to develop a color, a substantially colorless compound D having in the molecule thereof a polymerizable group and a site which inhibits reaction between the color-forming component A and the compound C, and a photopolymerization initiator comprising the organic dye and the organoboron compound.

16. A recording material according to claim 12, wherein the photopolymerizable composition includes microcapsules enclosing a color-forming component A, a polymerizable compound, and a photopolymerization initiator

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comprising the organic dye and the organoboron compound and includes, outside the microcapsules, a substantially colorless compound E which reacts with the color-forming component A to develop a color.

17. A recording material according to claim 8, wherein i is an integer selected from 2 to 4.

18. An image-recording process comprising the steps of:

(a) preparing a recording material by laminating at least one recording layer on a support, with the at least one recording layer including a photopolymerizable composition comprising (i) a polymerizable compound including an addition-polymerizable unsaturated bond, (ii) an organic dye, and (iii) at least one kind of an organoboron compound represented by the following general formula (I) in a proportion of at least one mole per mole of the organic dye

General formula (I)



wherein R is selected from the group consisting of an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group, an aralkyl group, a substituted aralkyl group, an alkaryl group, a substituted alkaryl group, an alkenyl group, a substituted alkenyl group, an alkynyl group, a substituted alkynyl group, an alicyclic group, a substituted

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alicyclic group, a heterocyclic group, a substituted heterocyclic group, and a derivative thereof; R_s may be the same as or different from each other; two or more of these groups may join together directly or via a substituent and form a boron-containing heterocycle; and X represents an alkali metal, quaternary ammonium, pyridinium, quinolinium, diazonium, morpholinium, tetrazolium, acridinium, phosphonium, sulfonium, oxosulfonium, iodonium, S, P, Cu, Ag, Hg, Pd, Fe, Co, Sn, Mo, Cr, Ni, As, or Se;

(b) exposing the recording layer image-wise to light at least once using at least one light source so that the photopolymerizable composition forms a latent image;

(c) heating the recording material so that the color-forming components develop colors according to the latent image to form an image; and

(d) irradiating the recording layer surface with light so as to fix the image formed and decolorize the organic dyes.

19. An image-recording process according to claim 18, wherein the step of exposing includes using a plurality of light sources of different wavelengths.

20. An image-recording process according to claim 18, wherein the step of preparing a recording material includes laminating a plurality of recording layers on the support, with the recording layers being sensitive to light of different wavelength from one another.

21. An image-recording process according to claim 18, wherein the step of preparing a recording material includes

providing microcapsules comprising a color-forming component in at least one recording layer.

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